

REMARKS

Entry of the above amendment and reconsideration of the above-referenced application in view of the above amendment, and of the following remarks, is respectfully requested.

Claims 1-7 and 9-12 are pending in this case. Claims 1, 3, 7, 9, 10, and 12 are amended herein and claim 8 is cancelled herein.

The Examiner rejected claims 1-2 and 4-12 under 35 U.S.C. 102(e) as being anticipated by Zistl et al. (U.S. Patent 6,806,191).

Applicant respectfully submits that amended claim 1 is unanticipated by Zistl as there is no disclosure or suggestion in Zistl of gaseously doping the copper film with silicon without forming a copper silicide by flowing a gas chemistry consisting essentially of silane over the copper film. Zistl teaches applying a first and a second reactive plasma environment to a copper film at a surface of a semiconductor wafer. The first reactive plasma environment comprises nitrogen and ammonia. The second reactive plasma environment is created by adding silane to the first reactive plasma environment. (col.6, lines 7-10). Thus, the second reactive plasma environment comprises silane, nitrogen and ammonia. There is no disclosure or suggestion in Zistl of flowing a gas chemistry consisting essentially of silane over the copper film as required by the claim. Accordingly, Applicant respectfully submits that claim 1 and the claims dependent thereon are unanticipated by Zistl.

Applicant respectfully submits that claim 7 is unanticipated by Zistl as there is no disclosure or suggestion in the reference of doping said copper interconnect with silicon without forming a silicide by flowing silane over a surface of the copper interconnect prior to striking a plasma. As discussed

TI-36238

5

above, Zistl teaches applying a first and a second reactive plasma environment to a copper film at a surface of a semiconductor wafer. The first reactive plasma environment comprises nitrogen and ammonia. The second reactive plasma environment is created by adding silane to the first reactive plasma environment. (col. 6, lines 7-10). As taught in Zistl, the silane is added to a plasma environment, i.e., after the plasma has already been struck. As pointed out in the reference (Col. 5, lines 63-66) upon the application of the RF power, a reactive plasma environment is established. The silane in Zistl is added to a previously created plasma instead of prior to striking the plasma as required by the claim. Accordingly, Applicant respectfully submits that claim 7 and the claims dependent thereon are unanticipated by Zistl.

The Examiner argues on page 3, paragraph number 4, that "Zistl et al. shows striking the plasma after flowing the silane for about 3 seconds" Applicant is unable to find where this is taught in Zistl. While Zistl does teach forming the silicon nitride in column 7, there is no showing in Zistl of flowing silane prior to striking (forming) a plasma, much less flowing silane for about 3 seconds prior to striking the plasma. The plasma already exists in Zistl when silane is added.

The Examiner rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Ngo et al. (U.S. Patent 6,211,084).

Applicant respectfully submits that amended claim 3 is patentable over Ngo et al as there is no disclosure or suggestion in Ngo et al of doping the copper film with silicon without forming a copper silicide by flowing a gas chemistry consisting essentially of silane over the copper film. Ngo teaches forming a copper silicide.

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-7 and 9-12. If the Examiner has

TI-36238

6

any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,



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TI-36238

7